

EVENT LENGTH
IN HOURS

DATE	DESCRIPTION	EVENT LENGTH IN HOURS	ANALYSIS
JULY 18-94	LOWER POWER CONT	24.00	EVANS + JONES CABLE REQ
19		24.00	
20		24.00	
21		24.00	
22		24.00	
23		24.00	
24		24.00	
25		24.00	
26	LOWER PWR CONT - 0955	9.92	
JULY 26-94	OFF AIR 0955-1745	7.83	MEASURE LINE + ANT W/ ANALYS
JULY 26-94	LOWER POWER 1745-	6.25	EVANS + JONES CABLE REQ
27	CONT	24.00	
28		24.00	
29		24.00	
30		24.00	
31		24.00	
AUG 1		24.00	
2	-1315	13.25	
AUG 23	OFF AIR 2111	0.05	JONES CABLE REQ
AUG 27	MOMENTARY OUTAGES	0.01	LIGHTNING
SEP 6	OFF AIR 1100-1739	6.65	LOOK FOR ARCING ENGINEER
SEP 8	OFF AIR 1342-1348	0.10	UNKNOWN
SEP 13	OFF AIR 1322-1410	0.80	UNKNOWN POSSIBLE WPTL LOS
SEP 15	OFF AIR 0300-0522	2.37	WPTL 12KV FEEDER SWITCH
SEP 15	OFF AIR 2142	0.01	POWER GLITCH
SEP 3	LOWER PWR TO 63%	14.00	EVANS + JONES CABLE REQ
4	CONT	24.00	" " " "

OCT 6 '94
OCT 6 '94

7

8

9

10

11

CONT - 1130

LOWER POWER 36%

CONT

- 0030

LOWER POWER 100% 1110-1534 TRY LOCATE ARC

OCT 11 TO PRESENT RUN AT 60% POWER - ARCLING PROBLEM AT

TOWER TOP

EVENT LENGTH
IN HOURS

11.50 EVANET JONES CABLE AREA

(12.50)

11.30-1

24.00

24.00

24.00

0.50

4.40

ATTACHMENT G



RALPH E. EVANS P.E.

Born in Eau Claire, Wisconsin, Ralph received a BS Degree in Electrical Engineering from the University of Wisconsin-Madison in 1947. He worked at WHA in Madison as a student transmitter operator from 1940-42--1945-47; his education being interrupted by the war while he was stationed at the Naval Research Lab in Washington D.C. working in Research and Development of radar transmitters - 1942-45.

From 1947-1967 he was the guiding technical force of Bartell Media Corporation, a Milwaukee-based national broadcasting and publishing giant. There he built six radio and four television stations, the first station being WEXT, a daytime station in Milwaukee, WI in 1947. During 1948-1955, other stations he built were in Stevens Point, Sturgeon Bay, and Appleton, Wisconsin; Charles City IA, Miami FL, and TV stations in Milwaukee and Madison, Wisconsin. During 1955-1960, the Company acquired fulltime AM stations in New York City, Boston, Atlanta, Birmingham, San Diego, Phoenix, and San Francisco - all of which Ralph improved by either increased power, site change, or purchase of up-to-date equipment. In 1961 he designed and built TV stations in Aruba, Curacao and Haiti.

In 1967 he formed a communications consulting company, Evans Associates, with his wife Rosa, and his three sons - Ralph, Jr., Larry and Ben. Evans Associates serves broadcast clients throughout the country.

Currently a large percentage of their consulting work is for studies to determine the future needs and method of delivery of educational programs to state schools in Wisconsin and other states.

Ralph is a full member of the Association of Federal Communications Consulting Engineers (AFCCE). He is a life member of the Institute of Electrical and Electronic Engineers; member of the Society of Broadcast Engineers with grade of Professional Broadcast Engineer, and licensed to practice as a Professional Engineer in the State of Wisconsin.

In July 1994, Ralph was inducted into the Wisconsin Broadcasters Hall of Fame. A plaque in his honor has been placed on permanent display at the State Historical Society in Madison, Wisconsin. The Wisconsin Broadcasting Hall of Fame was founded in 1989 to honor those who have devoted their careers to broadcasting and its development in Wisconsin.

ATTACHMENT H

ENGINEERING REPORT

RE: INTERFERENCE TO JONES CABLE COMPANY, RIPON, WISCONSIN

This report covers the period of April 23, 1994 through June 26, 1994 during the time we were working to determine the reason that WPKR was apparently causing interference to the Jones Cable Company located nearby.

According to WPKR, the interference started on December 10, 1993 after a section of the antenna inner bay line had been replaced, and the power increased to normal value. The inner bay line had apparently been damaged by a lightning strike earlier in the year.

On April 23, 1994, two engineers from this office went to the WPKR transmitter site near Ripon, Wisconsin. By the use of a spectrum analyzer, it was determined that at least some of the interference was coming from the WPKR tower, and that it was caused by electrical arcing. Improved grounding of all transmission lines on the tower, and the elimination of "casual contacts" on the tower and at the guy anchors, reduced the interference about 6 dB, but the effect on the cable company was not noticeably improved. Inspection of the section of the antenna inner bay line that had been replaced on December 9, 1993, showed a hole melted through the outer conductor of the 1-5/8" copper line. In this engineer's experience of 40 some years, the only thing that could have caused damage such as this was a lightning strike.

Assuming that there must be other damage to the antenna that was not discovered in December 1993, the decision was made to replace the 6-bay antenna with a single bay antenna on a temporary basis, so that the main antenna could be taken down from the tower and inspected carefully. This was done on May 24, 1994. Disassembly of the antenna revealed evidence of heating on the part of the inner bay line which had not been replaced.

Engineering Report - Page 2

Severe damage was found in the power splitter inner conductor, which was covered with carbon soot from melted insulators, and pitted from arcing to the outer conductor. Carbon is a conductor of electricity and arcing within a transmission line will occur when carbon is formed by the heating of the teflon insulators in the line. This damage is typical of the intense heat caused by a lightning strike. It is obvious that the damage to the antenna described above occurred at the same time (in 1993) as the damage to the inner bay line. This extra damage was not found at that time, and was the source of at least part of the interference to the cable company.

The main antenna was sent to the manufacturer for major repair, and it was reinstalled on the tower on June 16, 1994. On July 26, 1994 this engineering firm was retained by Allen Dick, the manufacturer of the WPKR antenna, to go to WPKR and test the antenna with sweep equipment provided by them. The antenna tested good. Several bullets in the transmission line were slightly loose, probably due to the high current from the lightning strike. These were repaired. At the conclusion of the above described work, the antenna and transmission line showed a return loss factor of only 1.07, a very respectable figure.

It is our opinion that the WPKR facility is now operating within all applicable FCC rules, and there are no spurious radiations from the antenna or transmitter than can cause interference to any other service.

While WPKR is now operating satisfactorily, the presence of the cable company's head end within 0.25 mile of the WPKR tower will continue to be a potential problem. It is possible that the cable company is receiving interference from other sources, and it is this engineer's recommendation that WPKR consider moving the transmitter to a less sensitive site.

This engineering report is true to the best of my knowledge and belief.



Respectfully submitted,

Ralph E. Evans
Ralph E. Evans P.E.
Consulting Engineer

FINAL ENGINEERING REPORT

RE: INTERFERENCE TO JONES INTERCABLE, RIPON, WISCONSIN

On April 14, 1994, this engineering firm was retained by Midwest Dimensions, Inc., licensee of Radio Station WPKR(FM) in Omro, Wisconsin, to investigate the cause of interference to a nearby cable TV headend located about 0.25 mile from the WPKR transmitting tower.

The WPKR antenna is mounted on a tower in Ripon, Wisconsin. The tower is owned by 4X Corporation, which also leases space to various 2-way and paging facilities. These facilities operate in the 860 and 450 MHz bands.

On April 23, 1994, two engineers from this office went to the WPKR transmitter site. By the use of a spectrum analyzer, it was determined that at least some of the interference was coming from the WPKR tower, and that it was caused by electrical arcing. There was no evidence of spurious radiations from the WPKR system, and a computer study on the frequencies of all services on the tower did not reveal any combinations that could be causing the problem. The spectrum analyzer displayed noise spikes over a very wide band; from about 30 MHz up to about 600 MHz. Improved grounding of all transmission lines on the tower, and the elimination of "casual contacts" on the tower and at the guy anchors, reduced the interference about 6 dB, but the effect on the cable company was not noticeably improved. Inspection of the section of the antenna inner bay line that had been replaced on December 9, 1993 showed a hole melted through the outer conductor of the 1 5/8" copper line. In this engineer's experience, the only thing that could have caused damage such as this was a lightning strike.

Assuming that there must be other damage to the antenna that was not discovered in December 1993, the decision was made to replace the 6-bay antenna with a single bay antenna on a temporary basis, so that the main antenna could be taken down from the tower and inspected carefully. This was done on May 24, 1994. Disassembly of the antenna revealed evidence of heating on the part of the inner bay line which had not been replaced.

Severe damage was found in the power splitter inner conductor, which was covered with carbon soot from melted insulators, and pitted from arcing to the outer conductor. Carbon is a conductor of electricity and arcing within a transmission line will occur when carbon is formed by the heating of the teflon insulators in the line. This damage is typical of the intense heat caused by a lightning strike. It is obvious that the damage to the antenna described above occurred at the same time (in 1993) as the damage to the inner bay line. This extra damage was not found at that time, and was the source of at least part of the interference to the cable company.

The main antenna was sent to the manufacturer for major repair, and it was reinstalled on the tower on June 16, 1994. When the transmitter was brought up to normal operating power (it had been operating at 10 KW pending the solution to the interference problem), it was noted that the reflected power as indicated by the Bird Watchmeter, was somewhat higher than normal (1 to 1.7). Further work on the system was terminated because of the necessity of getting the station back on the air.

Reports from the cable company in the days following the June 16, 1994 visit were not encouraging. The interference, although not as severe, was still a problem. The next few days were spent on phone conferences with the antenna manufacturer to try to come up with a solution. Meanwhile the station was operating with 10 KW transmitter output. No interference occurred at this power level. On July 26, 1994 this engineering firm was retained by Allen Dick & Co., the manufacturer of the WPKR antenna, to go to WPKR and test the antenna with sweep equipment provided by them. The antenna tested good. Several bullets in the transmission line were slightly loose, probably due to the high current from the lightning strike. These were repaired. At the conclusion of the above described work, the antenna and transmission line showed a return loss factor of only 1.07, a very respectable figure.

The transmitter power output was increased to the normal 16 KW. No interference at the cable headend was observed. Several days later, a call from the cable company reported some interference on TV Channels 2 and 5 starting at about 9:30 P.M. Further reports indicated that the interference was happening sporadically, and only at night. The transmitter output was again lowered to 10 KW.

Further talks with Allen Dick produced a plan to bypass the power splitter on the FM antenna to determine if this could be the source of the electrical arcing. Also, Allen Dick suggested replacing the clamps used to secure the antenna to the tower, with steel clamps instead of the present plastic ones. It had been noted that the antenna, except for the transmission line, was not grounded to the tower.

On September 6, 1994, we again visited the WPKR tower site. The attempt to bypass the power splitter and keep the station on the air did not work because it was impossible to tune just three bays of the antenna. The power splitter was brought down and inspected. No evidence of arcing was found, but the inner conductor of the 3" "T" section did appear to be slightly loose where it attached to the inner conductor of the 1 1/2" inner bay line. This was tightened and the power splitter was reinstalled and the antenna mounting clamps were changed to the all metal type. A good ground on the antenna was thus assured.

A final inspection on the tower turned up a cable clamp on one of the 4X transmission lines which had been clamped around the plastic jacket of the line and then grounded to a tower leg. The high RF field from the FM antenna had caused arcing which burned off the plastic jacket and pitted the outer conductor of the line. This clamp was removed since there were already enough properly-installed grounds on the line. At the conclusion of the above described work, the transmitter was turned on and brought up to full power. The observed return loss factor was 1:1.03.

This problem has been difficult to solve. At the onset of our investigation, it became obvious that the interference was caused by electrical arcing in the antenna and at various places on the tower. As the locations of the arcing were identified one by one and eliminated, the interference to the cable company decreased in intensity and duration. This procedure took longer than expected because of the requirements for protection from RF radiation which made it necessary to turn the transmitter off when tower personnel were near the FM antenna. Finally on September 6, 1994 it was believed that the last sources of arcing that could cause interference to the cable company had been identified.

From September 6, 1994 to this date, September 16, 1994, there has been no reports of interference from the cable company. We are optimistic that the problem has finally been solved.

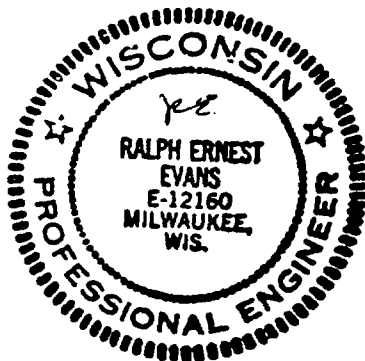
Respectfully submitted,



Ralph E. Evans P.E.

September 16, 1994

.WPKR-FRpt



ATTACHMENT I

Of

7-F

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554

13 MAY 1994

IN REPLY REFER TO:
1800B3-WBE

Midwest Dimensions, Inc.
Radio Station WPKR(FM)
3891 Waukau Road
Oshkosh, WI 54903

In re: WPKR(FM), Omro, Wisconsin
Midwest Dimensions, Inc.
STA

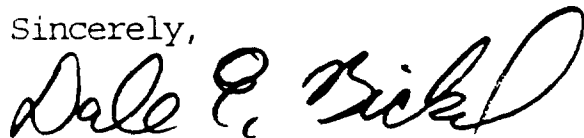
Dear Licensee:

This refers to your attorney's letter dated May 5, 1994, requesting special temporary authority (STA) to operate at reduced power (80% of that specified in your license BMLH-910821KI) while attempting to resolve interference allegations against WPKR. You have stated that WPKR has engaged the services of Mr. Ralph Evans to assist the licensee in resolving the allegations of interference.

In view of the above, SPECIAL TEMPORARY AUTHORITY IS HEREBY GRANTED to operate at reduced effective radiated power as needed. This authority expires November 15, 1994.

Please notify the FM Branch by letter when full power operations resume.

Sincerely,



Dale E. Bickel
Supervisory Electronics Engineer
FM Branch
Audio Services Division
Mass Media Bureau

cc: Eugene T. Smith